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IMAGERY
ANALYSIS
DIVISION

PIR

PHOTOGRAPHIC INTELLIGENCE REPORT

[redacted]

ANALYSIS OF SELECT 1964-65

ACTIVITY LAUNCH COMPLEXES A & B

SSATC, USSR

[redacted]

25X

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CIA/PIR 61067

[redacted]

DATE Nov 1965

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PAGES 40

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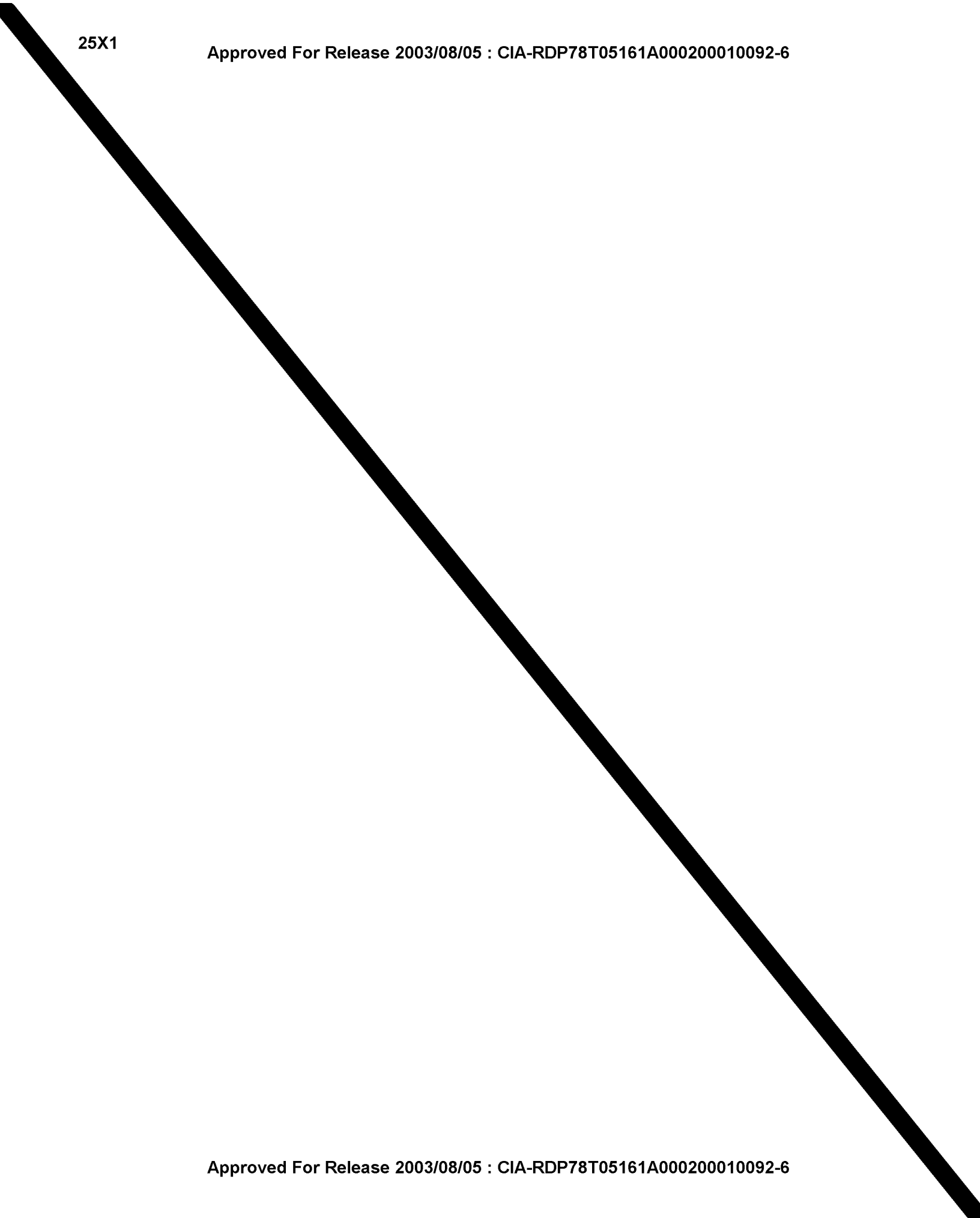

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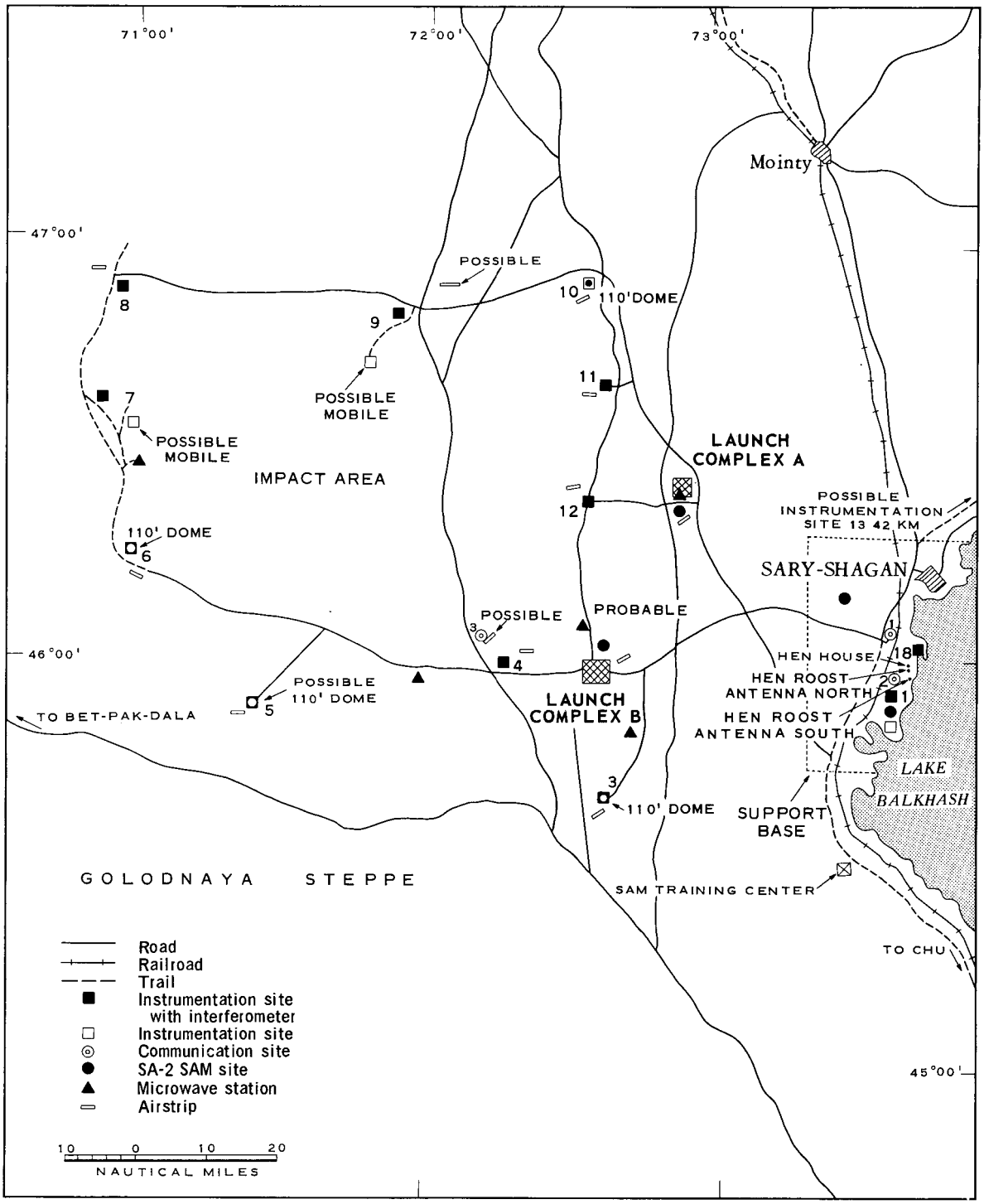

LOCATION OF LAUNCH COMPLEX A AND LAUNCH COMPLEX B, SSATC, USSR.

CIA IMAGERY ANALYSIS DIVISION [redacted] 25X

CIA/PIR-61067

ANALYSIS OF SELECT 1964-65 ACTIVITY

AT LAUNCH COMPLEXES A AND B

SARY SHAGAN ANTIMISSILE TEST CENTER, USSR

INTRODUCTION

This report is in response to CIA requirements requesting a detailed analysis of certain objects imaged on recent photography of launch complexes at the Sary Shagan Antimissile Test Center, USSR. Some of these objects have been reported in Mission OAKS following rapid analysis; others have been discovered during more detailed analysis.

To increase the data input, isodensity recording analysis has been employed. In response to a specific requirement, copies of applicable isodensity recordings are made a part of this report. Special attention is directed to the statement printed on each recording and to the information below.

General Principles

X1 The [redacted] Double Beam Microdensitometer used by the NPIC Technical Intelligence Division for these recordings, has been adapted to include recently developed isophotometer equipment. When used with the attachment, it is properly called an Isodensitracer (IDT).

The optical system of the IDT automatically makes a series of closely spaced parallel scans. For each scan of the specimen a corresponding coded parallel line is recorded, forming a contour map of the scanned area.

The code in the recorded lines indicates the amount of density change in known preset increments and also shows whether the density is increasing or decreasing. When density is increasing, the three-symbol code line is printed in the sequence: blank-dot-line-blank-dot-line. Whenever the density is decreasing, the symbol sequence changes to: line-dot-blank-line-dot-blank. Each symbol in the sequence represents a density increment and is continuously plotted until the density in the specimen changes by that increment; then the next symbol in the sequence is plotted.

When the IDT has completed a scan, recording the density profile along that single scan line in code, the pen lifts from the recording paper and both the specimen table and the recording table return to the starting X position. At the same time the specimen table and the recording pen step in the Y direction, then the next scan is begun. This sequence is repeated automatically until the instrument has mapped the density of the specimen area. Contours are thus formed by adjacent like symbols.

Precise specimen-to-record magnifications can be set at from 1:1 to 1:1000 in the X direction as in the basic [redacted] instrument and at from 1:1 to 1:3100 in the Y direction. The X and Y ratios can be set separately. 25X1

Reason for Caution

Though the isodensity trace has potential as an important tool for the photo/image interpreter, there is currently little confidence in the results achieved, due primarily to the lack of an adequate experience base.

One thing is certain, isodensity recording analysis and photo analysis go hand in hand. Though the photographic image can, to a large degree, be analyzed separately, the isodensity recording must be analyzed in conjunction with the photographic image from which the trace was produced. The quality and scale of the photographic image relates directly to the results achieved. Image degradations, caused by limitations of the photographic system, also degrade the isodensity trace. Caution must be used in establishing whether any minute density gradient portrayed in the recording relates directly to an object configuration. An irregular object may at time appear regular, and vice versa, due to illumination angle and surface reflectivity. As an example, object color, texture, shadows falling across the object, displacement due to obliquity, non stereo, and image edge gradient, are only a few of the factors which must be considered. Consequently a concurrent perceptual and objective analysis of the density trace, and the stereo photo image, must consider all known factors. Such an analysis can only be performed by a qualified photo/image interpreter, preferably one who personally operates the isodensitracer equipment.

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LAUNCH COMPLEX B, SSATC

Feature/Object/Activity	Photo Reference	Analysis
Prime-mover with transporter at Launch Position B-3, Facility B, (Figures 1 and 1A).		A probable GALOSH missile canister on a transporter with an attached prime mover is located 35 feet in front (west) of the B-3 erector mechanism. The overall length measures 85 feet. The prime mover measures 20 feet and the probable GALOSH missile transporter 65 feet. This excellent photography permits a height measurement of 10 feet for the prime mover and 15 feet for the probable GALOSH canister.
An object at Launch Position B-3, Facility B, (Figure 1B).		A probable GALOSH missile canister approximately 65 feet long is at Launch Position B-3. It appears to be abutted to the erector mechanism-not engaged as

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Feature/Object/Activity	Photo Reference	Analysis
An object at Launch Position B-3, Facility B, igure 1C).		A probable GALOSH missile canister is abutted to the erector mechanism at Launch Position B-3. It does not appear to be engaged in the erector as on The probable GALOSH missile canister measures 65 feet in length. It is highly probable that this is the same object seen four days earlier in the same position.
Vehicle on access road to launch pad, Facility A, (Figure 2), (Transporter 1). Vehicle in the Missile Assembly and Checkout area, (Figure 2), (Transporter 2).		Prime mover with transporter trailer is parked on the access road to the launch pad. Overall dimensions are approximately Transporter/trailer 1 measures approximately 20 feet in length and the prime mover approximately The isodensity trace (Figure 3) reveals the trailer cargo/load (if any) is probably more regularly configured than the cargo/load on transporter 2 parked in the Missile Assembly Checkout area (Figure 4). The latter prime mover and transporter trailer have an overall dimension of approximately

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Feature/Object/Activity	Photo Reference	Analysis
		The transporter trailer measures approximately
Object on service road to Facility A launch pad,		The image quality does not permit a meaningful analysis of the object. The object is possibly the missile handling equipment revealed by parked in approximately the same location. It was also present in this location on
Elongated dark shape approximately 55 feet long, with little height on the west edge of Launch Pad B-2, (Figure 5).		) a very high quality mission, reveals that considerable dark stain is present between concrete slab sections in the same area referenced on the left. This stain was not present on The feature seen on has little or no height and cannot be identified. The isodensity recording for this feature (Figure 6) does not permit identification.

Feature/Object/Activity		Analysis
A vehicle parked at launcher at Position B-4, (Figure 5).		The object at Launch Pad B-4 measures approximately feet in length and is a probable GALOSH canister in position, possibly with the aft end of the canister engaged between the erector mechanism. Isodensity recording is Figure 7.
An object at Launch Pad B-3,		This object is the erector mechanism on its turntable. There is no evidence of a missile, missile canister, or transporter at Launch Pad B-3 on this date.
An object parked at Launch Position B-4, Facility B, (Figure 7A).		A probable GALOSH missile canister is in position at Launch Position B-4 with the aft end of the canister probably engaged in the erector mechanism. The forward portion of the probable canister extends approximately 50 feet out in front (west) of the erector mechanism.
An object in position at Launch Position C-1, Facility C, Figure 7A).		The aft end of a probable GALOSH missile canister is engaged in the erector mechanism

Feature/Object/Activity	Photo Reference	Analysis
		at Launch Position C-1 which is adjacent to the triad facility. It measures approximately 70 feet, extending from the east edge of the erector mechanism through the erector mechanism. The probable GALOSH missile canister "points" in a west-south-westerly direction.

LAUNCH COMPLEX A, SSATC

A 40-55 foot object parked near Launch Position 1, Launch Site 3, (Figure 8).		The reported dark object is probably two objects rather than one. A probable missile on launcher or a launcher alone constitutes one of the objects, and a separate, unidentified, vehicle measuring approximately 35 feet long constitutes the other (Figure 9).

X1 25X

Feature/Object/Activity		Analysis
Unidentified elongated objects in the area of Launch Position 5 and 6, Launch Site 3, (Figure 10).		At Launch Position 5, Launch Site 3, an unidentified object measuring approximately 35 feet long, including the launcher, is pointing toward the access road from the launch point (Figure 11). Two unidentified objects are still located in the ready end of the launch position, as previously reported. A probable launcher is present at the launch point of Position 6. The isodensity recording did not reveal an elongated object at the latter position.
Four possible transporters at Launch Site 1, (Figure 10).		Four possible transporters approximately 40 feet long, parked to the rear of Launch Site 1.
A possible missile measuring 30 to 45 feet long on the launcher at Launch Position 5, Launch Site 3, (Figure 12).		A possible launcher approximately 35 feet long, with its long axis oriented with the approximate long axis of the revetment. The isodensity recording is Figure 13.

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Feature/Object/Activity

Three large objects (80 to 100 feet long), observed southwest of Launch Sites 3 and 4,

Analysis

This mission actually revealed four elongated dark shapes, as annotated 1 through 4 in Figure 14. The measurement of these dark shapes was done on the photographic image where photo analysis could not confirm or negate the lack of continuity within each dark mass. Measurements were as follows:

Object 1 - 75 feet total

Object 2 - 105 feet total

Object 3 - 105 feet total

Object 4 - 85 feet total

An isodensity trace of objects 2, 3, and 4 at only 200 magnifications and a density increment of .08D did not reveal sufficient detail, nor did it record the density range present in the image (Figure 15).

Feature/Object/Activity	Photo Reference	Analysis
		Consequently, isodensity recordings at 1,000 magnifications and .04D density increment were produced for each of these objects. This is identical to the techniques employed on most of the previous recordings. The results are shown in Figures 16 through 19.
		The isodensity recording for object 1 (Figure 16) is distorted on one end by a scratch in the emulsion, however, the remainder of the object is satisfactorily portrayed. The object is suspected to be a missile with the possibility that the southern most density bulge represents the sustainer wings (the nose of the suspect missile is pointing south) and the smaller bulge just north of it possibly the booster section. The distortion caused by the emulsion scratch prevents identification of the northern portion of the mass.
		Object 2 (Figure 17) is probably at least three

Feature/Object/Activity	Photo Reference	Analysis
		separate objects. The pattern of density changes and the irregular configuration of the largest mass suggest a suspect empty missile transporter.
		Object 3 (Figure 18) does not resemble either object 1 or object 2, however, it probably is an irregular object or objects.
		Object 4 (Figure 19) probably consists of more than two separate objects located on the narrow portion of the road, as depicted in Figure 20. The latter drawing shows the approximate location of each of the objects, shown on a line drawing made from a [redacted] mission. 25X1

CONCLUSIONS

Though an adequate technique for performing measurements on isodensity recordings must yet be developed, it is believed the recordings shown in this report have been, in part, helpful in the analysis. As the total analysis technique is further improved, it is believed that more isodensity recording will be demanded by the photo/image analyst.

However, the consumer must recognize that the time required to complete a specific project will be appreciably increased by the addition of this technique.

As regards the substantive portion of this report, it is believed the analysis, when combined with other referenced information, probably indicates that a GALOSH type canister is yet to be photographed at Sary Shagan Launch Complex A.

MENSURATION

All measurements have been made on photography by the CIA/IAD project analyst, using scale factors derived from NPIC/TID measurements. NPIC/TID generally considers accuracy of measurements as follows: From [redacted] photography, on the order of plus or minus 5 feet or 5 percent, whichever is greater. With good quality [redacted] photography, plus or minus 10 feet or 5 percent, whichever is greater. The percentage of error decreases as distance increases and vice versa. Experience has revealed that measurements performed by the CIA/IAD project analyst have an accuracy factor which is generally similar to that of the NPIC/TID measurements used for scale factors, however, they should be considered as approximate only.

25X1

25X1

REFERENCES

[redacted]

DOCUMENTS

CIA. PIR-13/64, Comparison of Possible AMM - Associated Facilities at Moscow and Sary Shagan, USSR, August and September 1963 (TOP SECRET

CIA. PIR-1014/65, , Suspect GALOSH Launch Site From "Rockets On Guard For Peace" (Soviet Source), June 1965 (TOP SECRET

CIA. PIR-61017, , Possible Location of GALOSH Missile Launch, August 1965 (TOP SECRET

CIA. Memorandum Report, M/EB 129/65, 21 April 1965 (TOP SECRET

NPIC/R-57/65 GALOSH Missile, Moscow Parade, 7 November 1964 (SECRET)

NPIC/R-1115/64 Revised Mensural Data on Griffon Surface-to-Air Missile, February 1964 (SECRET)

REQUIREMENTS

C-RR5-83,016
C-RR5-83,019
C-RR5-83,019 - Supplement 1
C-RR5-82,360

CIA/IAD PROJECT

30403-6
30419-5

LIST OF ILLUSTRATIONS

Figure 17 - Isodensity Trace of Object 2, Launch Site 3, Launch Complex A,

Figure 18 - Isodensity Trace of Object 3, Launch Site 3, Launch Complex A,

Figure 19 - Isodensity Trace of Object 4, Launch Site 3, Launch Complex A,

Figure 20 - Line Drawing Showing the Location of Objects 1 Through 4, Launch Site 3, Launch Complex A,

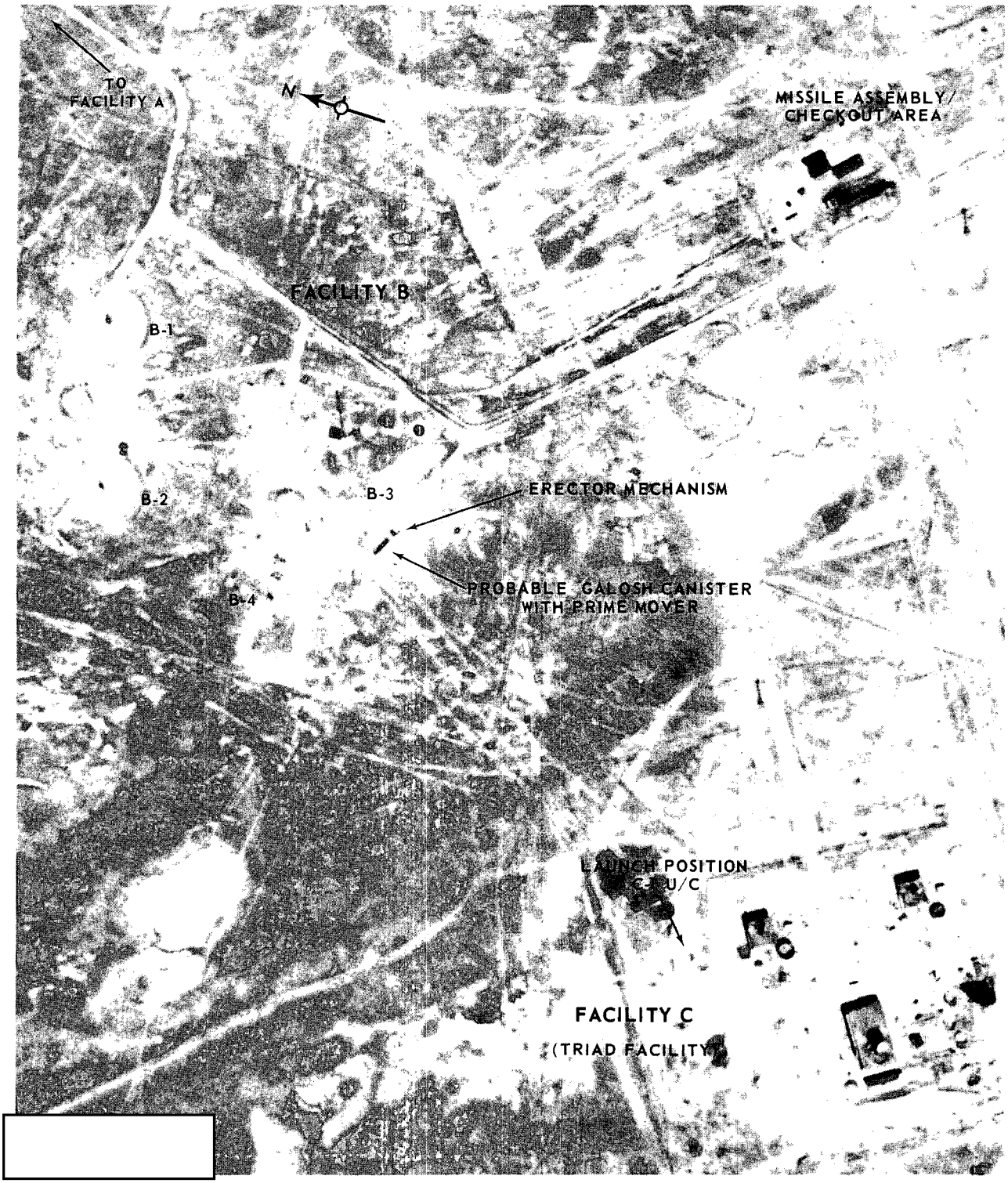

FIGURE 1. PROBABLE GALOSH MISSILE WITH PRIME MOVER AT FACILITY B, LAUNCH COMPLEX B, SSATC.

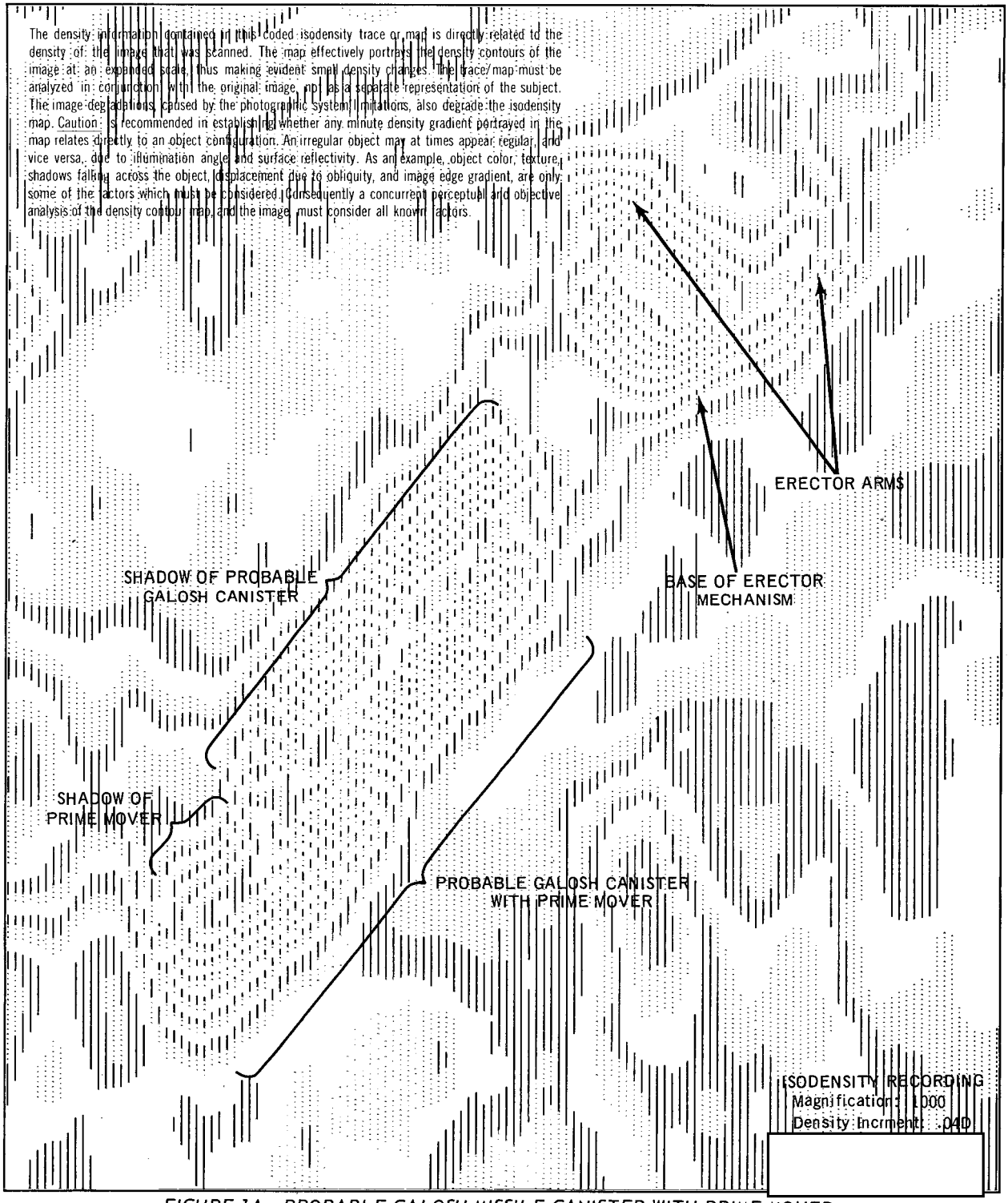

FIGURE 1A. PROBABLE GALOSH MISSILE CANISTER WITH PRIME MOVER, FACILITY B, LAUNCH COMPLEX B, SSATC.

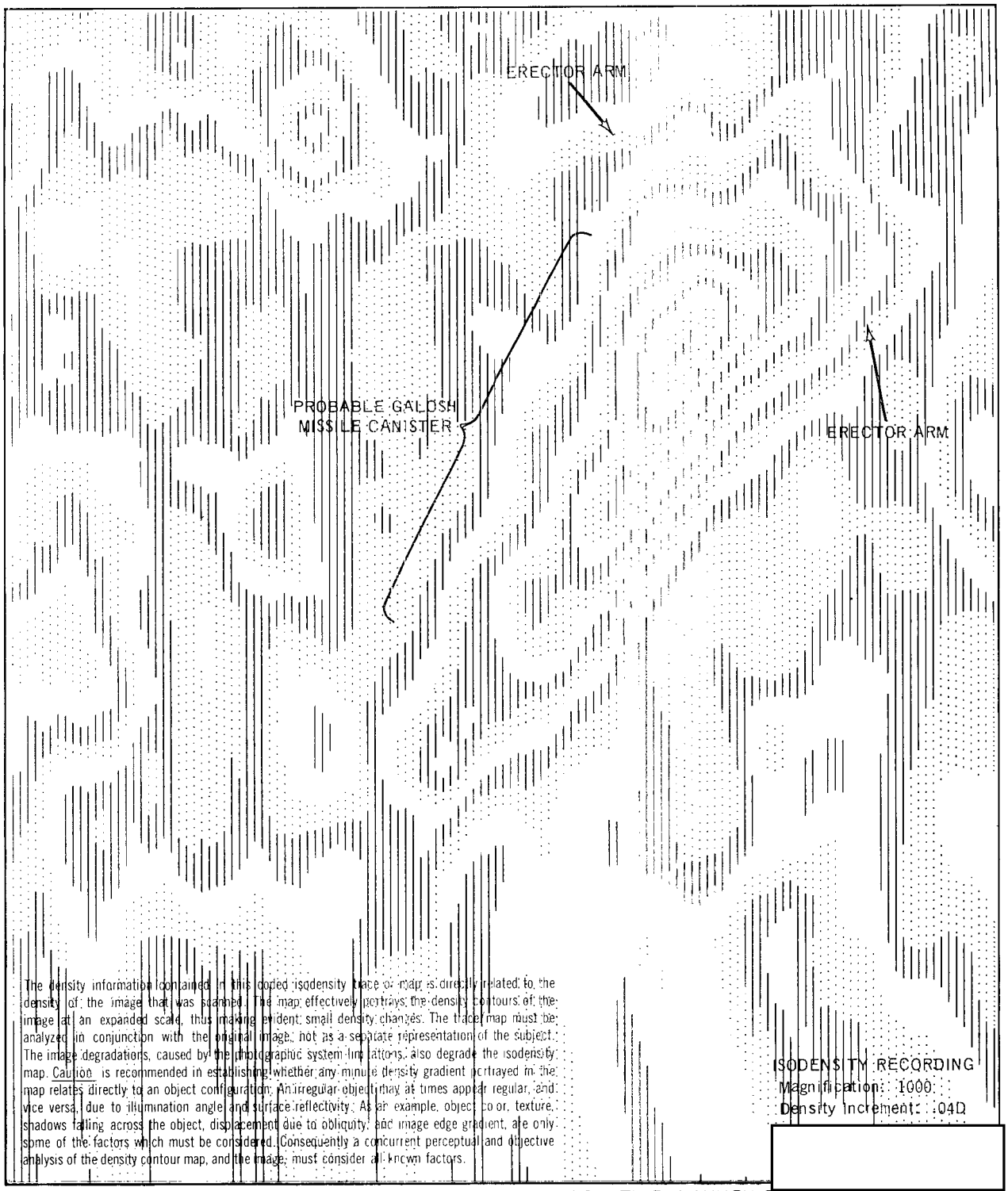

FIGURE 1B. PROBABLE GALOSH MISSILE CANISTER, FACILITY B, LAUNCH COMPLEX B, SSATC.

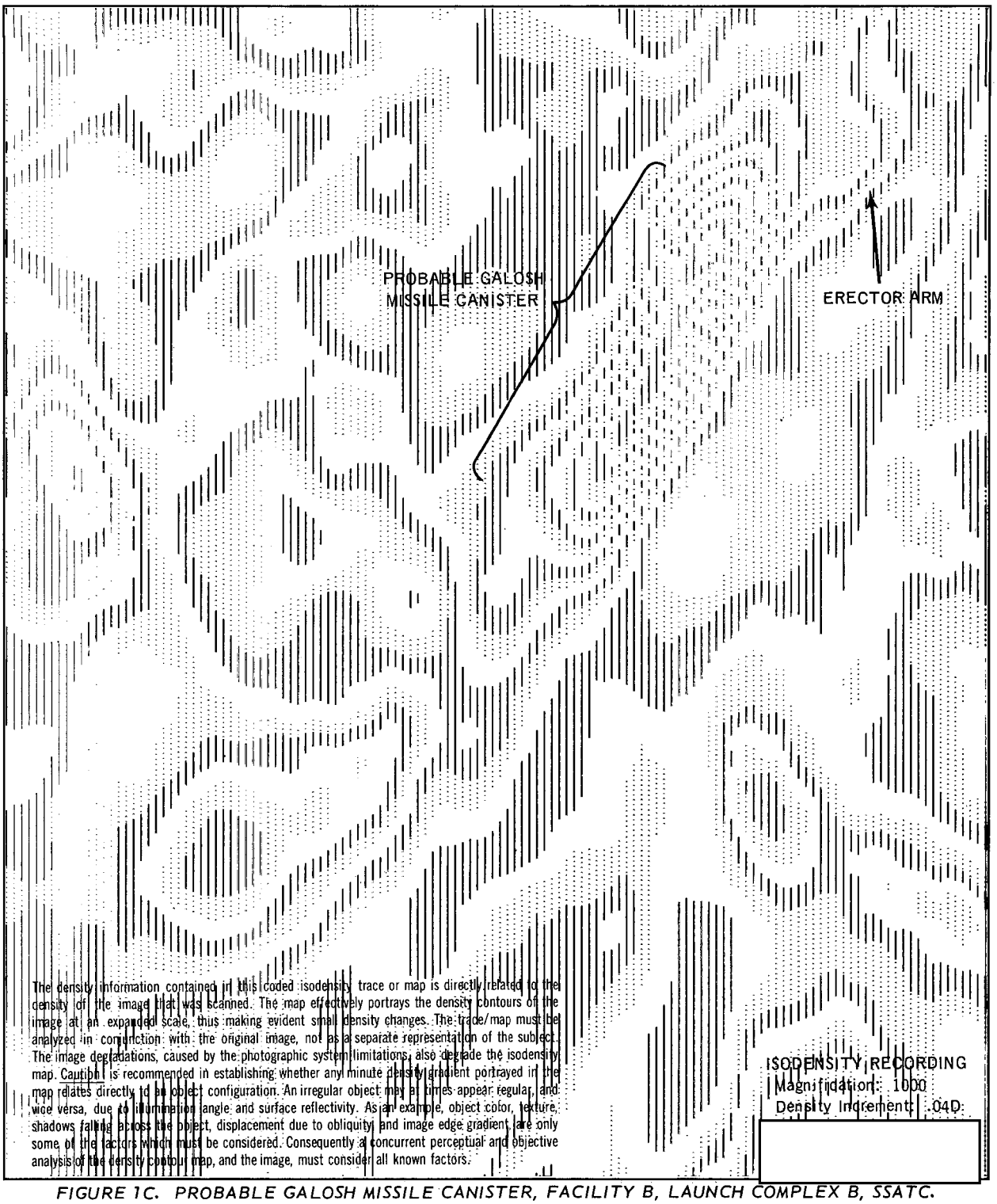

FIGURE 1C. PROBABLE GALOSH MISSILE CANISTER, FACILITY B, LAUNCH COMPLEX B, SSATC.

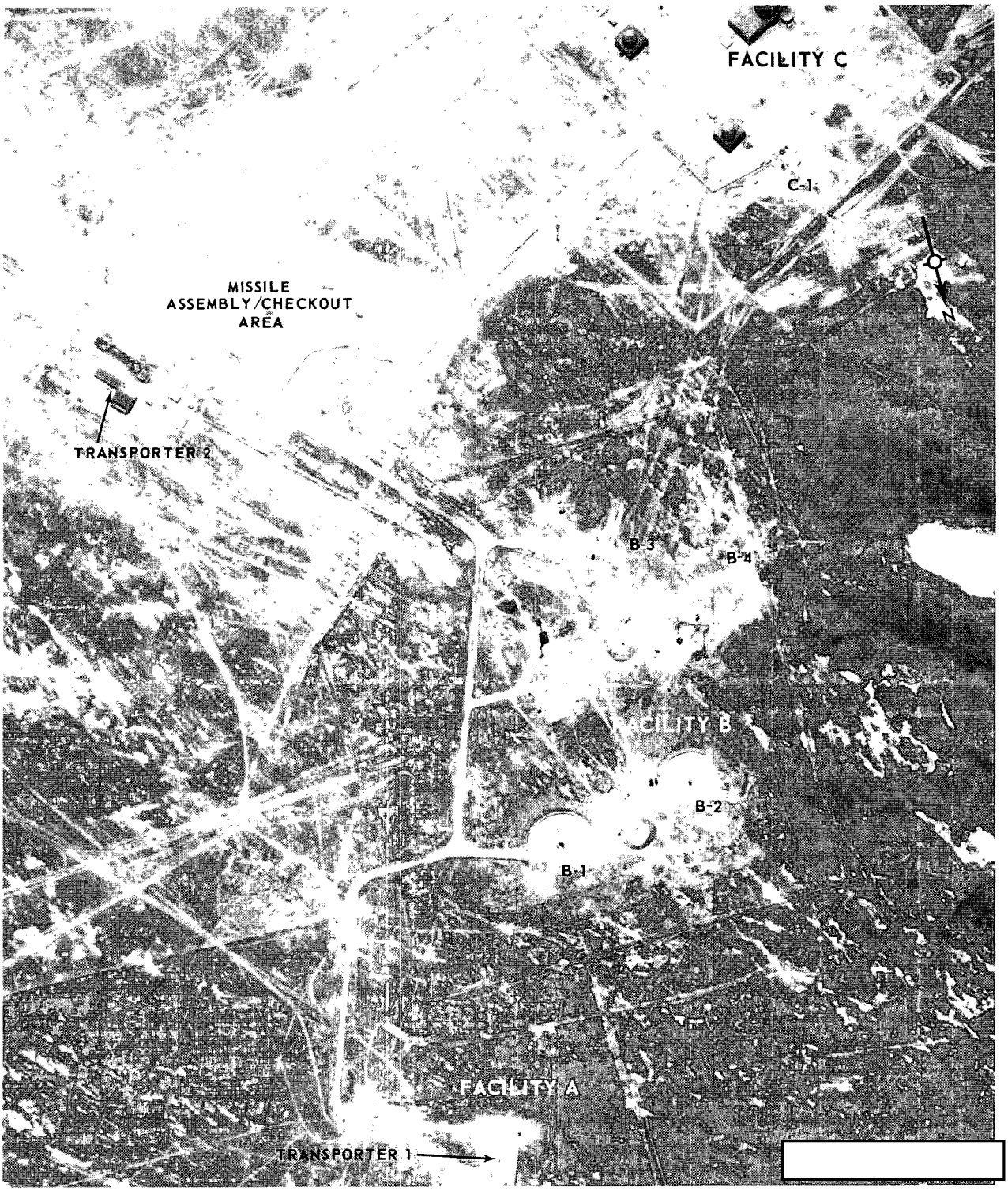

FIGURE 2. OPERATIONS AREA, LAUNCH COMPLEX B, SSATC, USSR.

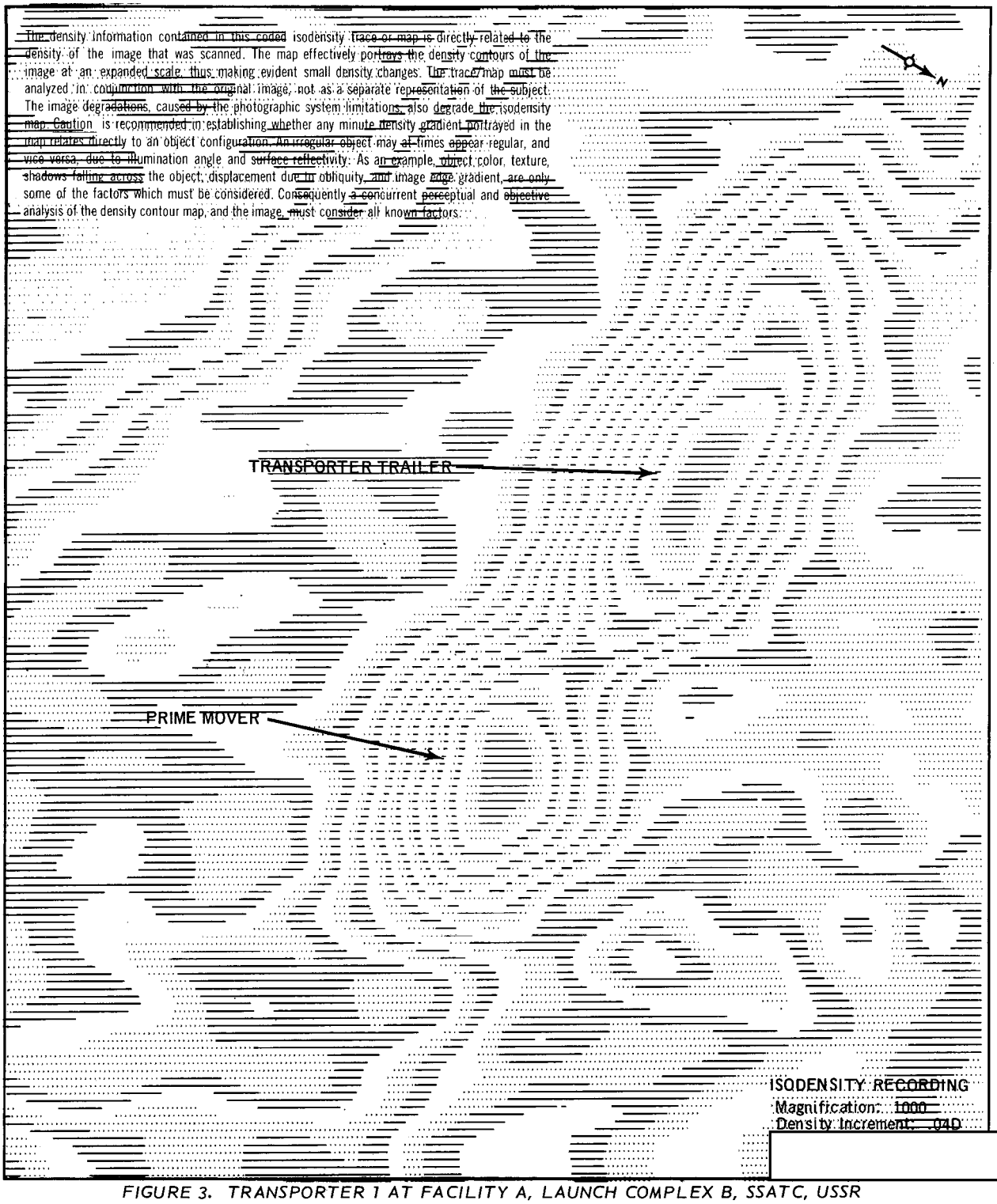

FIGURE 3. TRANSPORTER 1 AT FACILITY A, LAUNCH COMPLEX B, SSATC, USSR

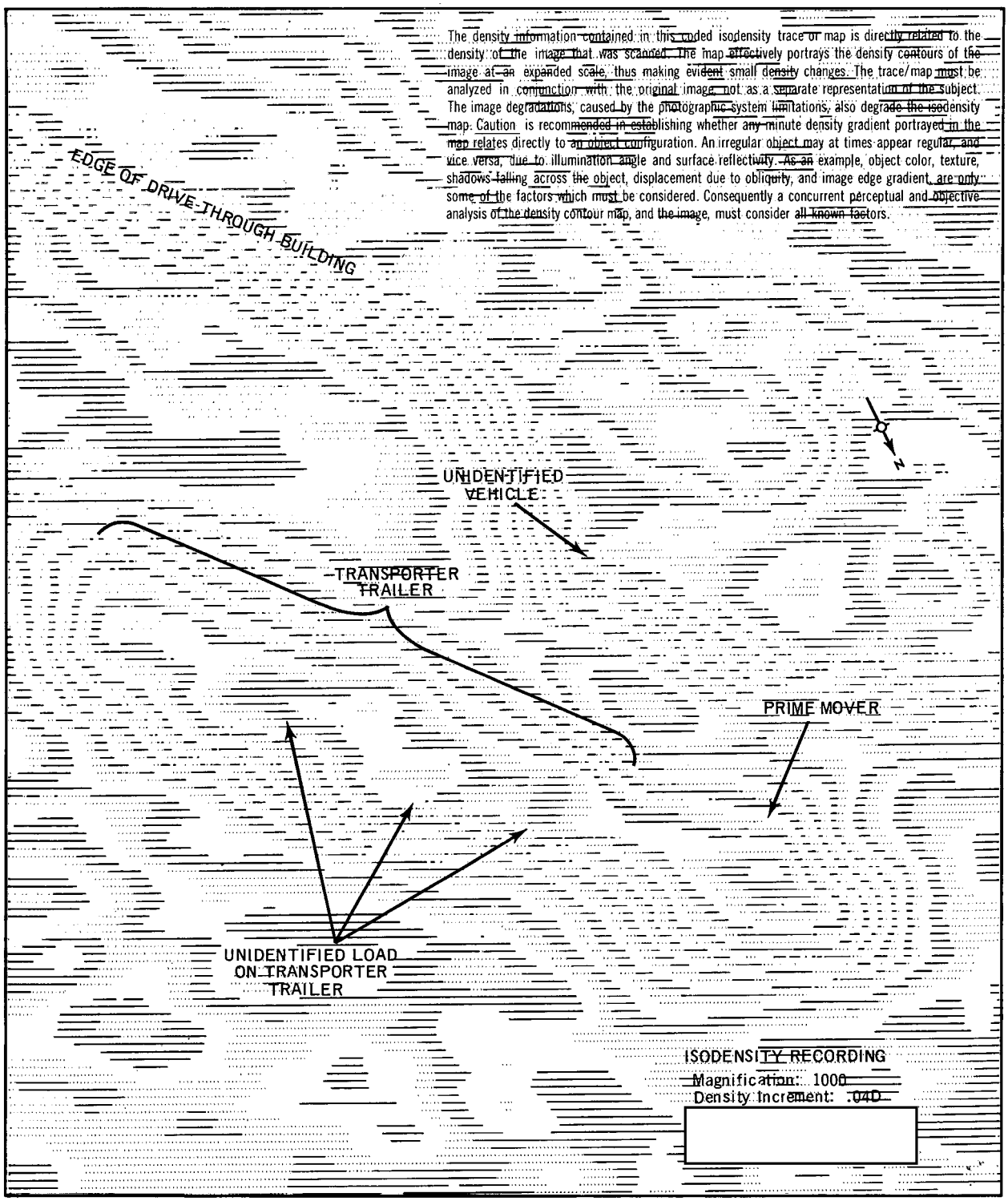

FIGURE 4. TRANSPORTER 2 AT LAUNCH COMPLEX B, SSATC, USSR

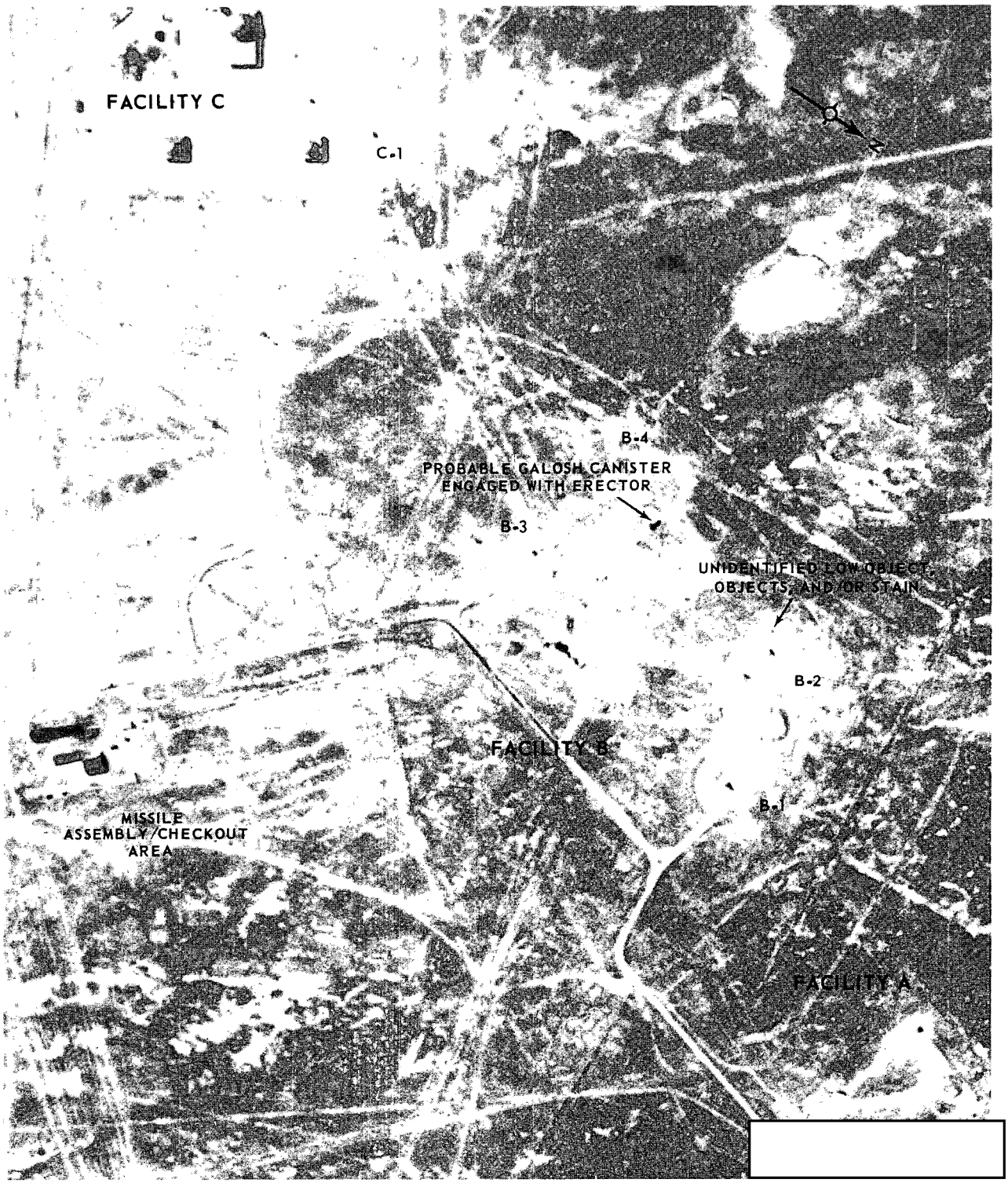

FIGURE 5. OPERATIONS AREA, LAUNCH COMPLEX B, SSATC, USSR.

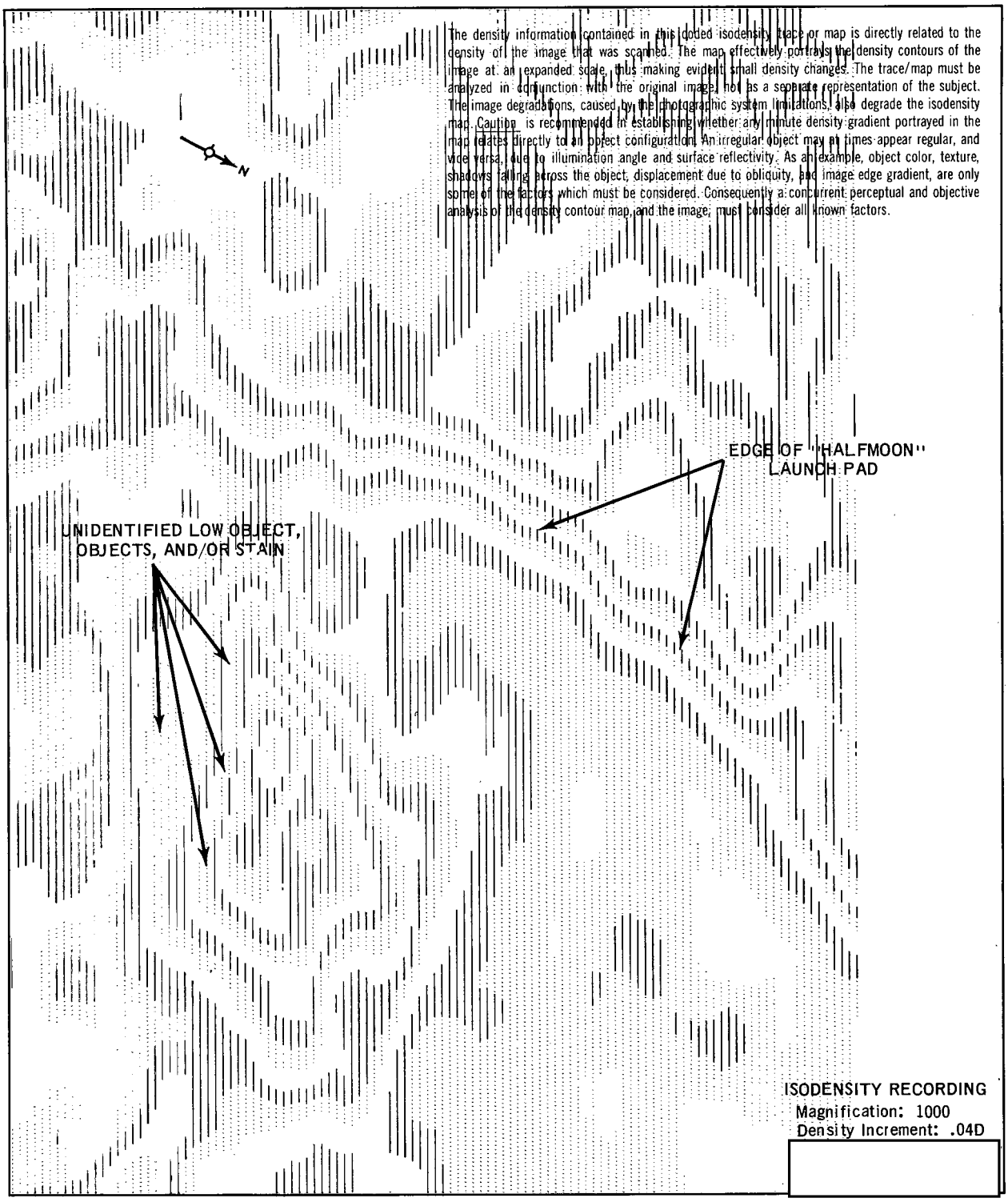

FIGURE 6. LAUNCH POSITION B-2, LAUNCH COMPLEX B, SSATC, USSR.

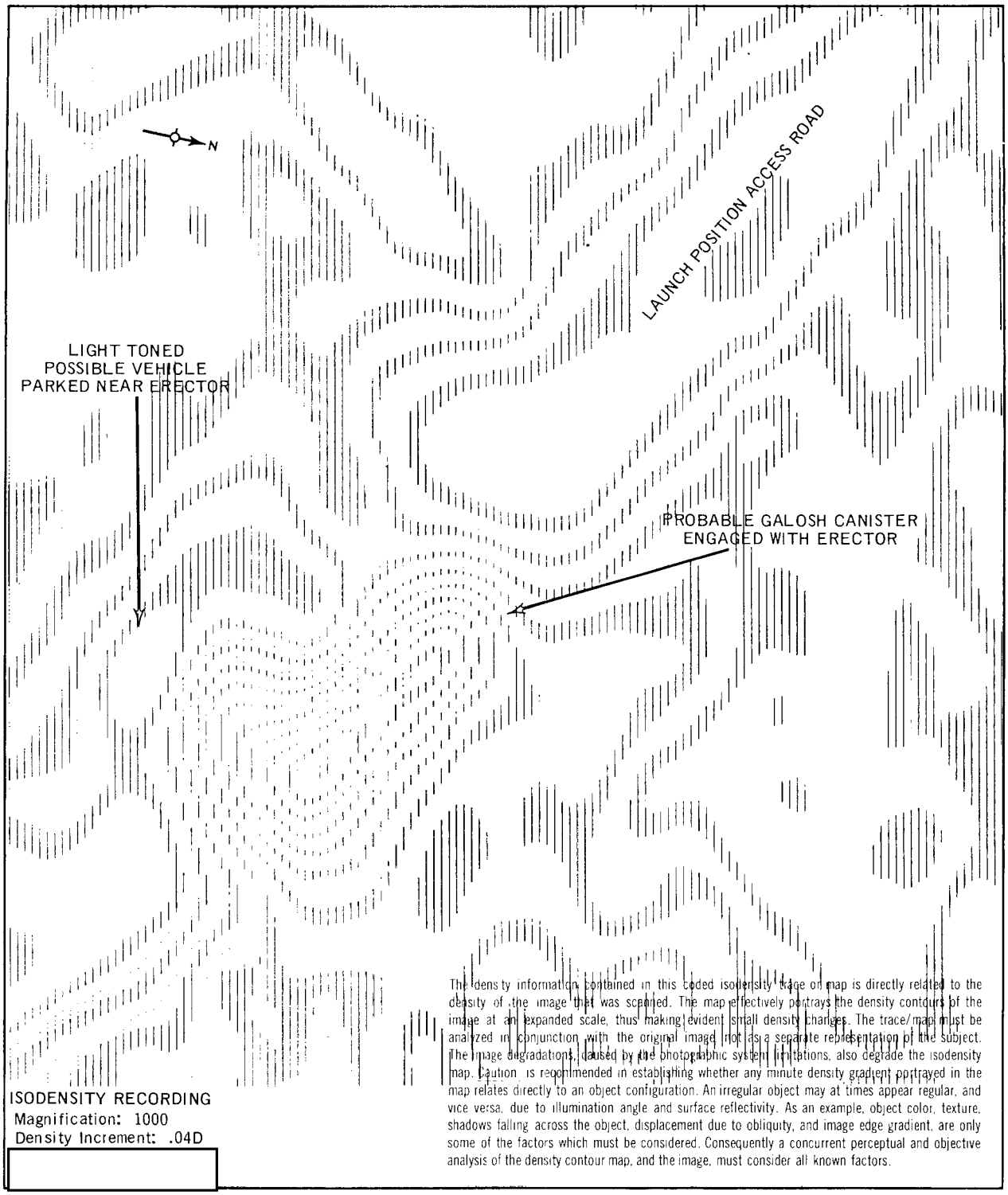

FIGURE 7. LAUNCH POSITION B-4, LAUNCH COMPLEX B, SSATC, USSR.

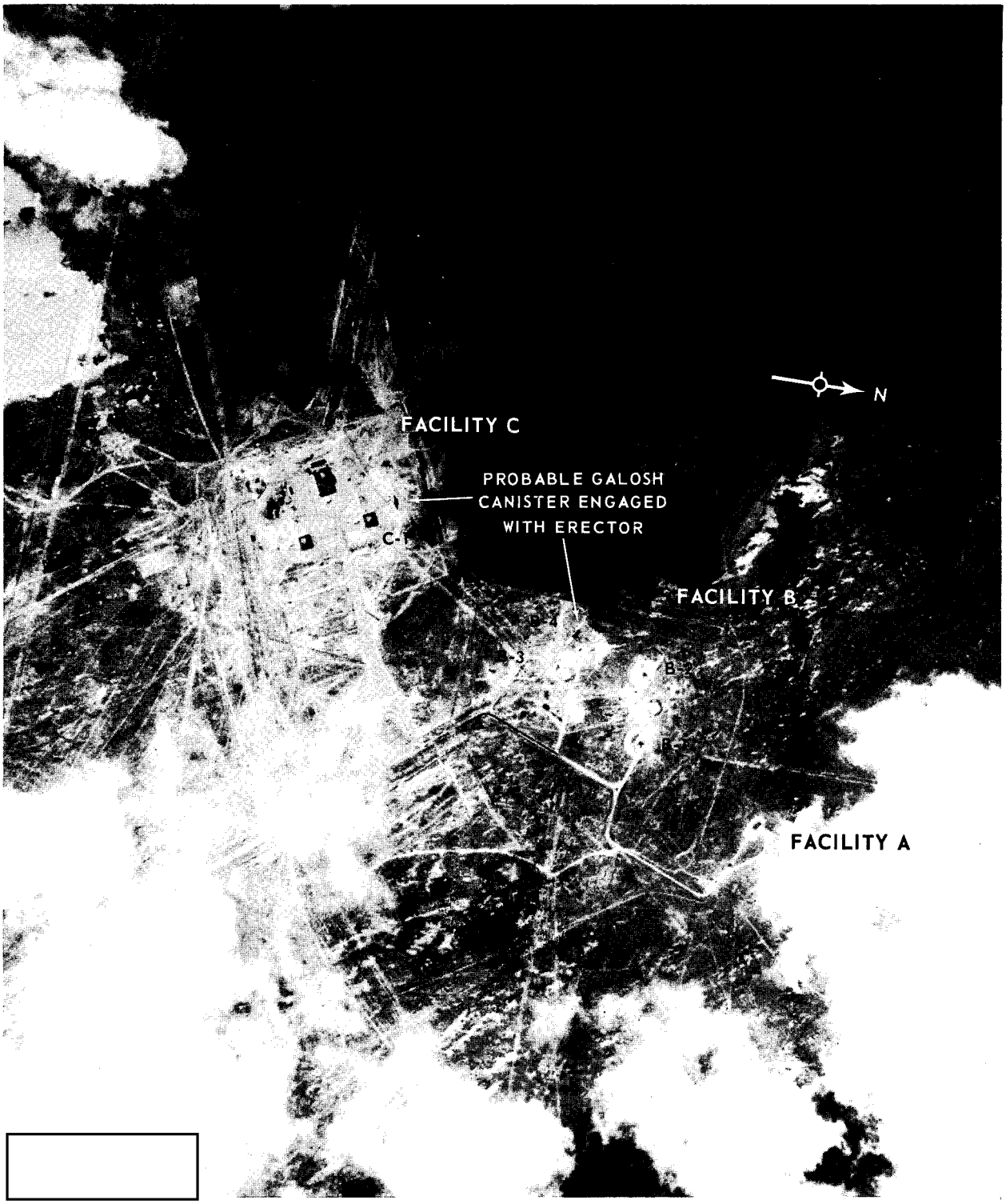

FIGURE 7A. OPERATIONS AREA, LAUNCH COMPLEX B, SSATC, USSR.

FIGURE 8. SOUTH AREA, LAUNCH COMPLEX A, SSATC, USSR.

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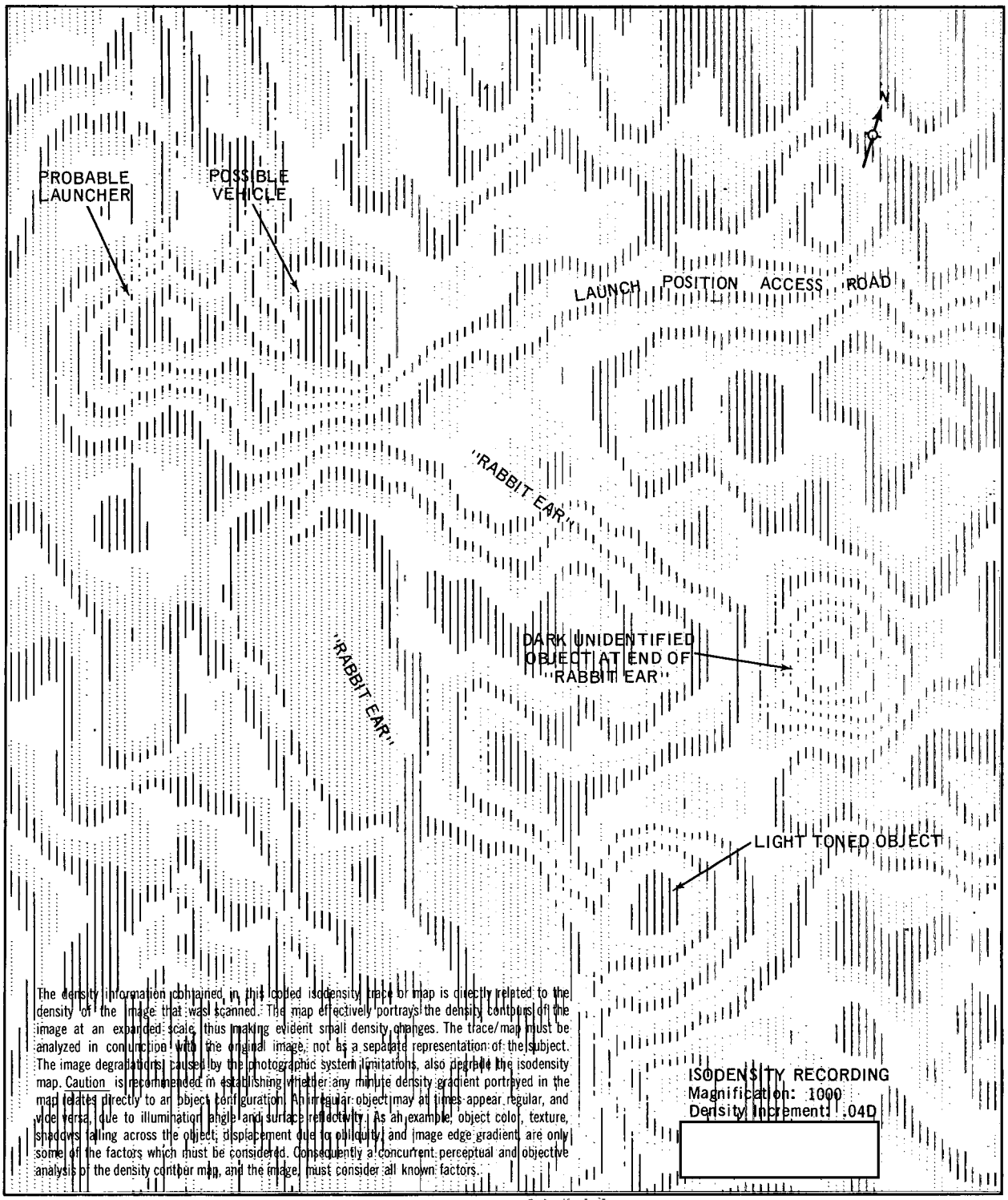

FIGURE 9. LAUNCH POSITION 1, LAUNCH SITE 3, LAUNCH COMPLEX A, SSATC, USSR.

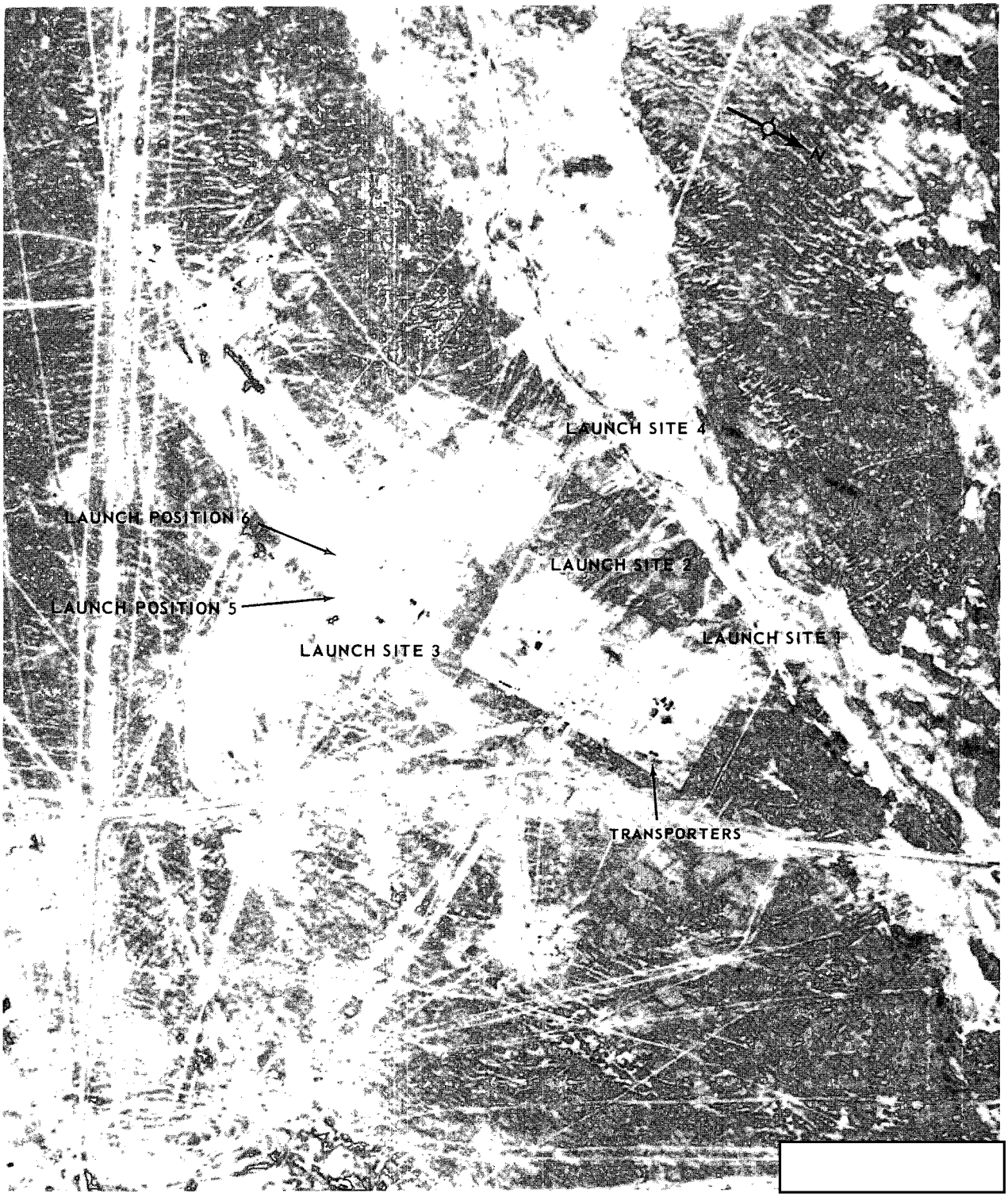

FIGURE 10. SOUTH AREA, LAUNCH COMPLEX A, SSATC, USSR.

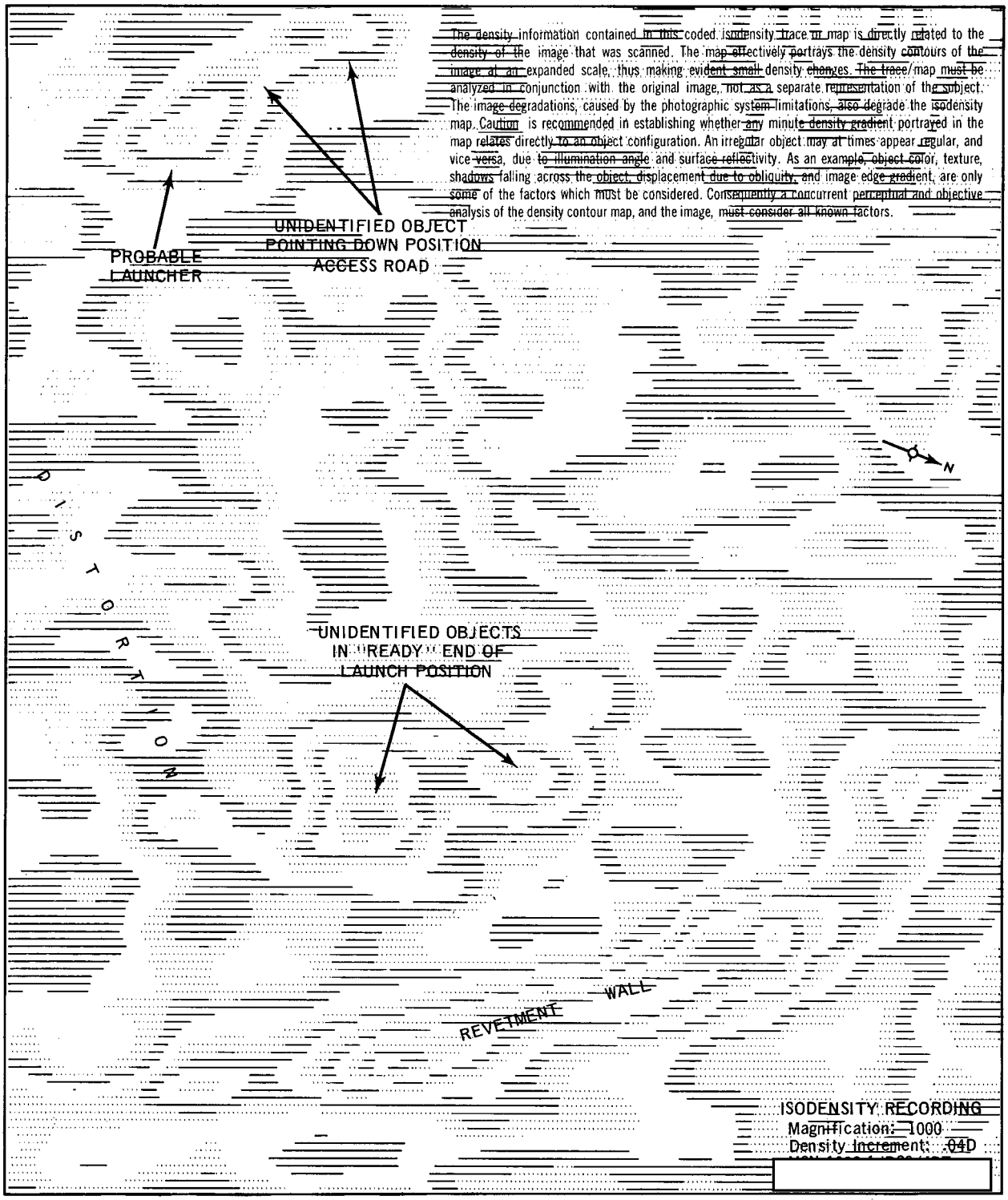

FIGURE 11. LAUNCH POSITION 5, LAUNCH SITE 3, LAUNCH COMPLEX A, SSATC, USSR.

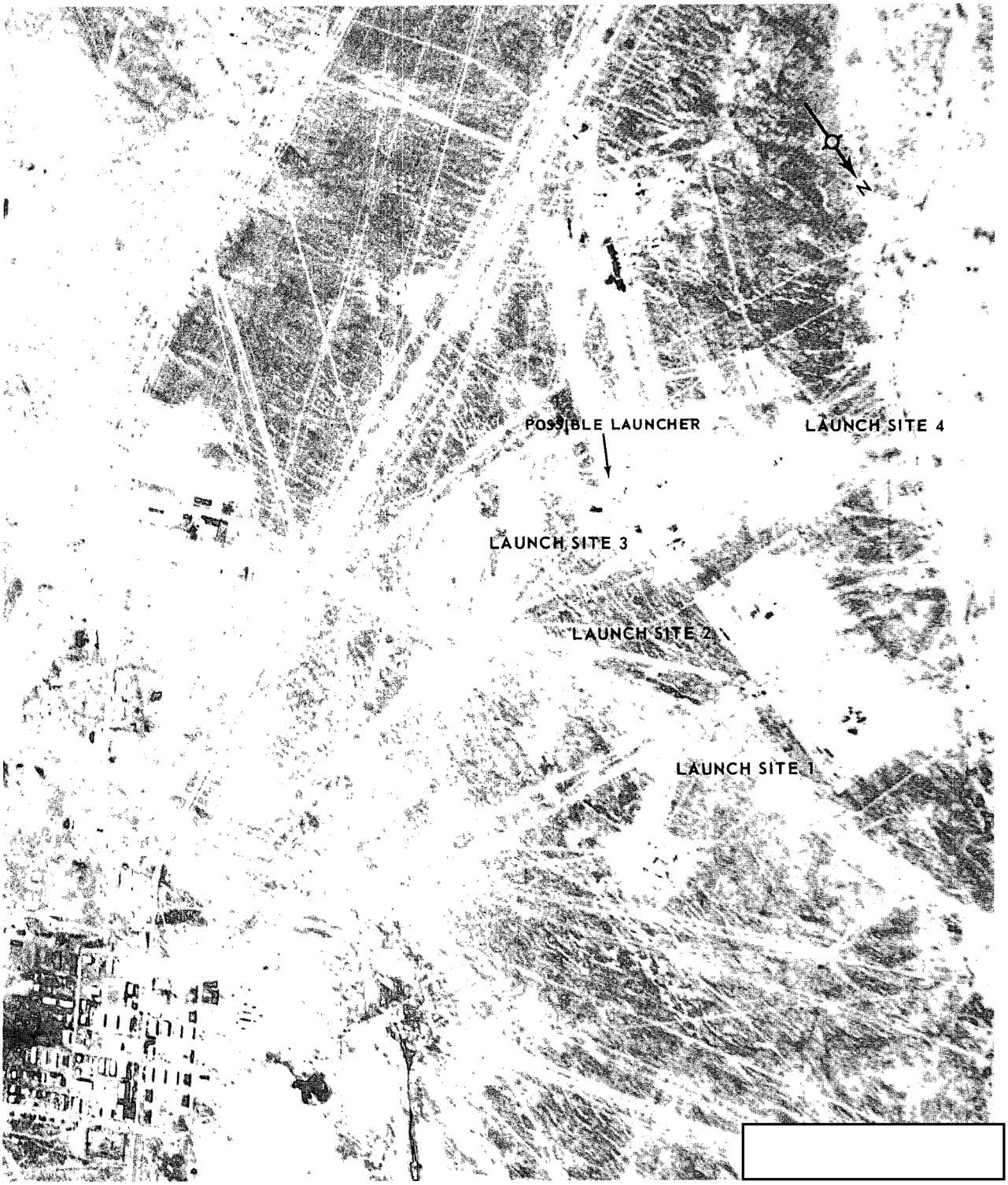

FIGURE 12. SOUTH AREA, LAUNCH COMPLEX A, SSATC, USSR.

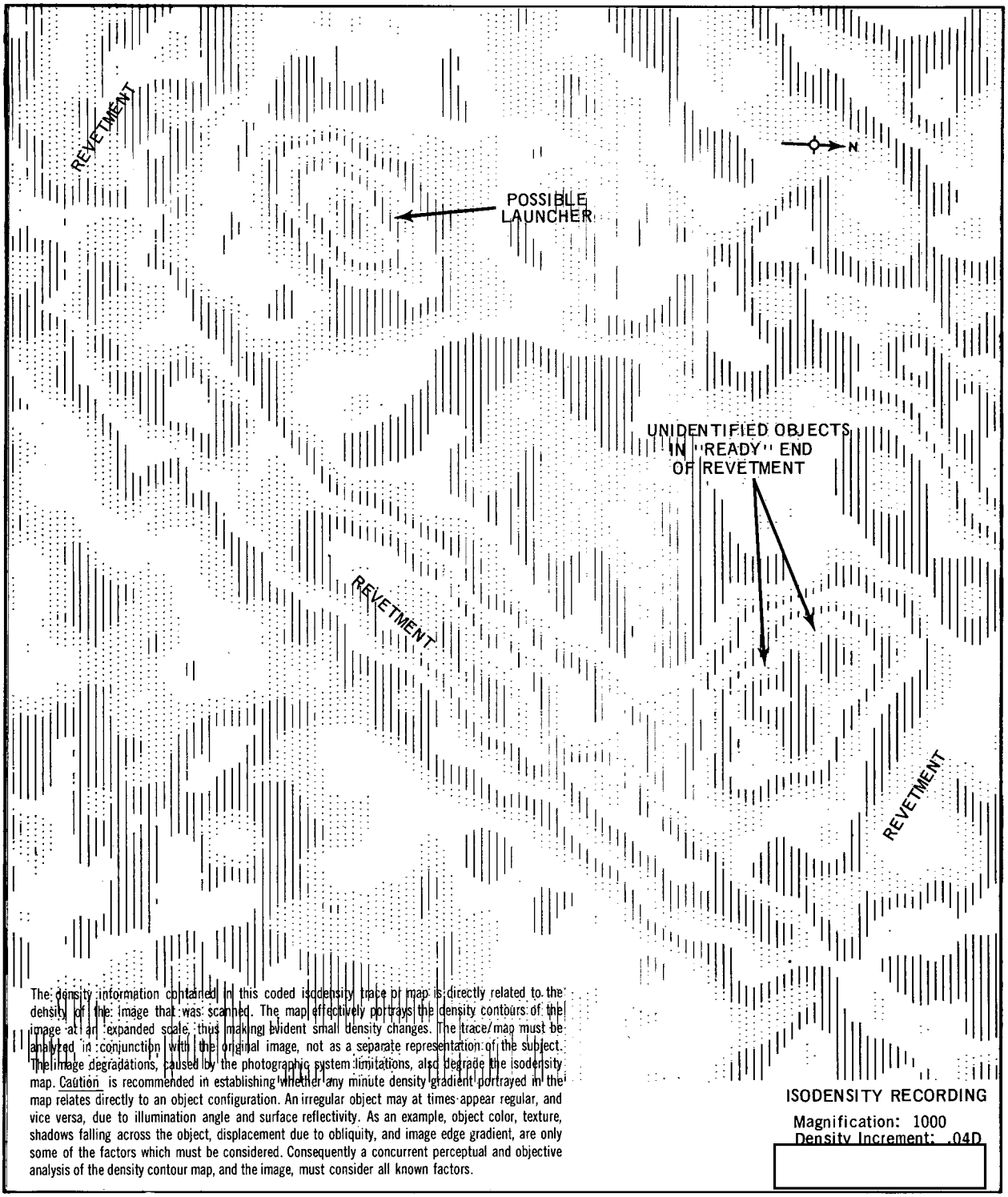

FIGURE 13. LAUNCH POSITION 5, LAUNCH SITE 3, LAUNCH COMPLEX A, SSATC, USSR

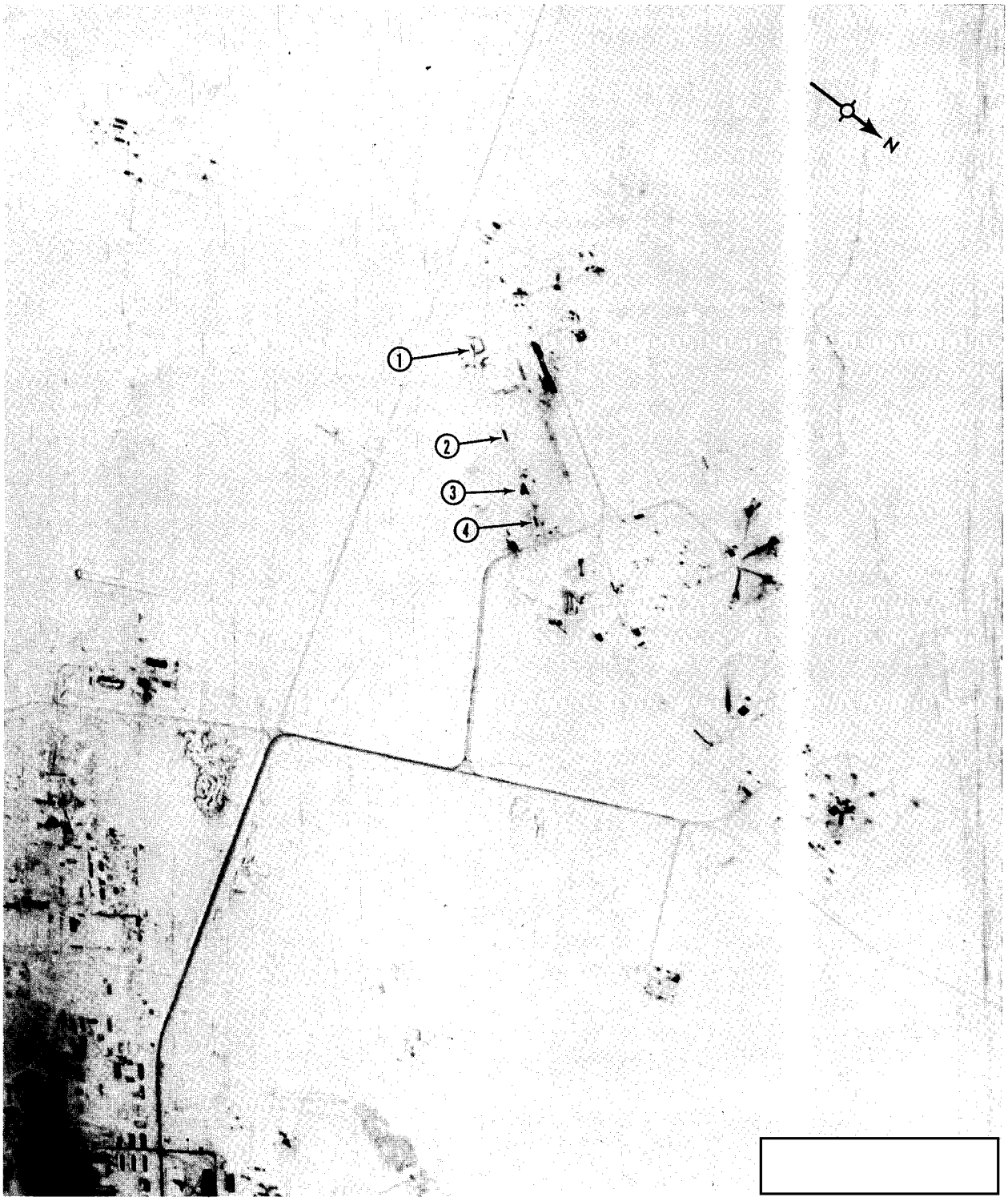

FIGURE 14. LAUNCH COMPLEX A, SSATC, USSR.

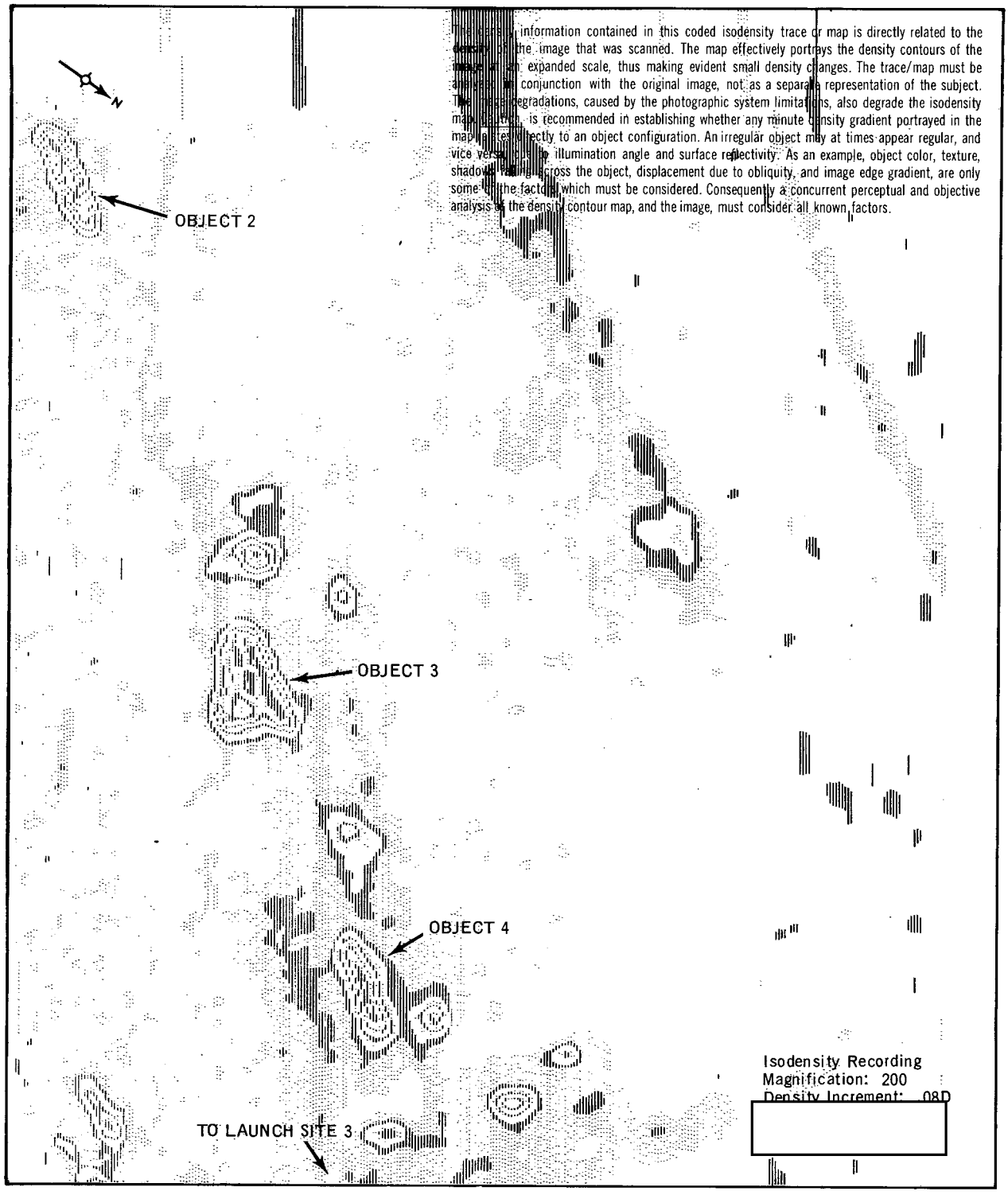

FIGURE 15. LAUNCH COMPLEX A, SSATC, USSR.

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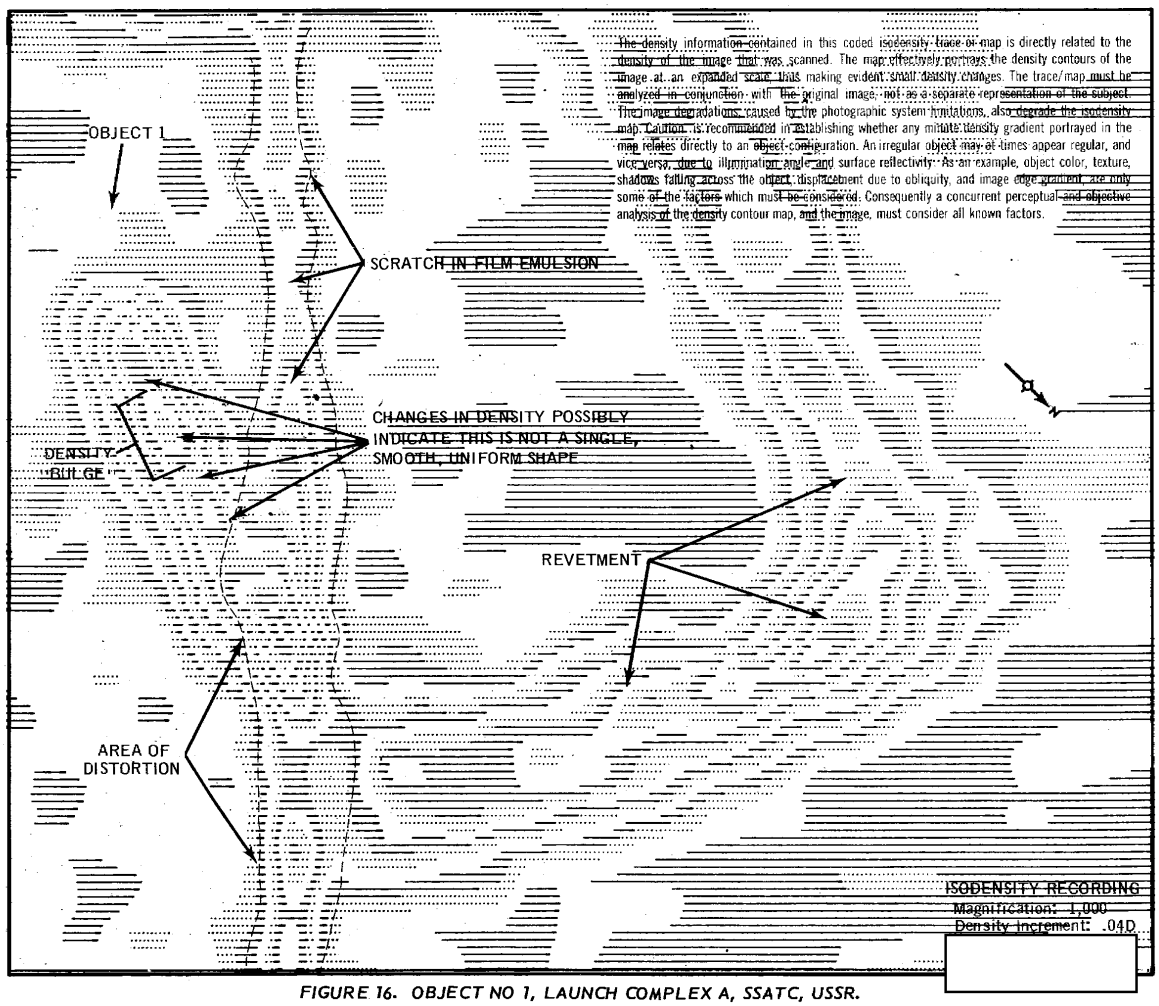

FIGURE 16. OBJECT NO 1, LAUNCH COMPLEX A, SSATC, USSR.

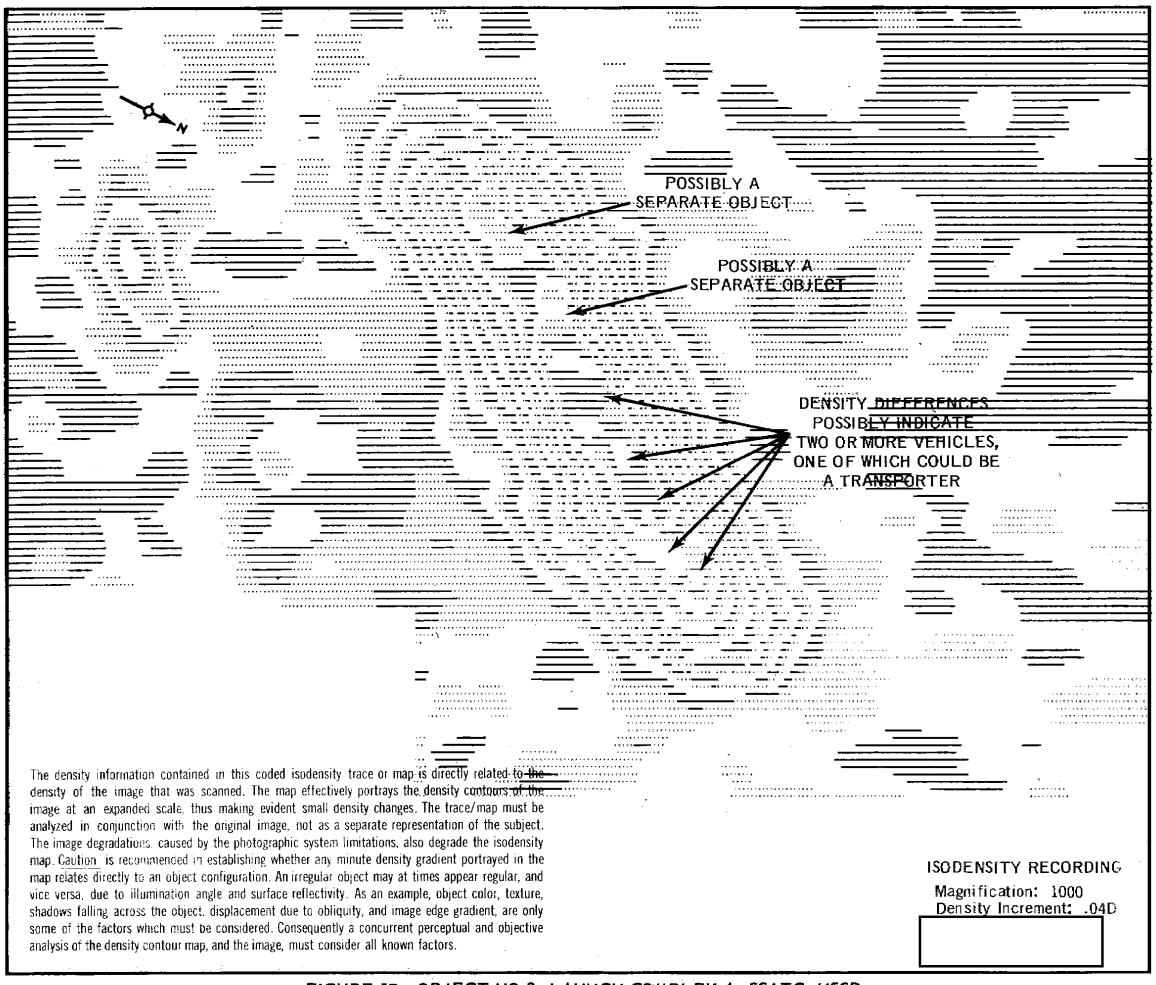

FIGURE 17. OBJECT NO 2, LAUNCH COMPLEX A, SSATC, USSR.

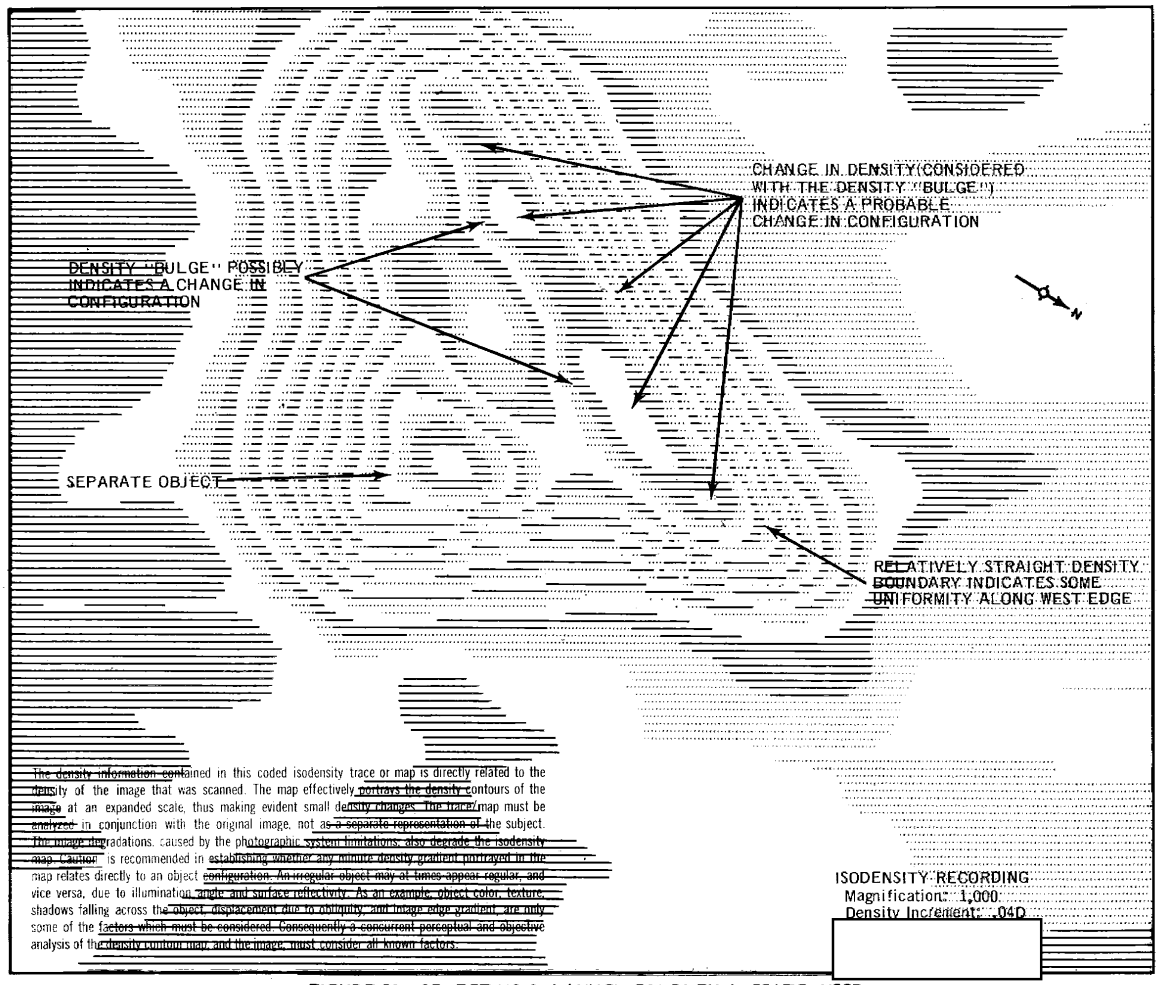

FIGURE 18. OBJECT NO 3, LAUNCH COMPLEX A, SSATC, USSR.

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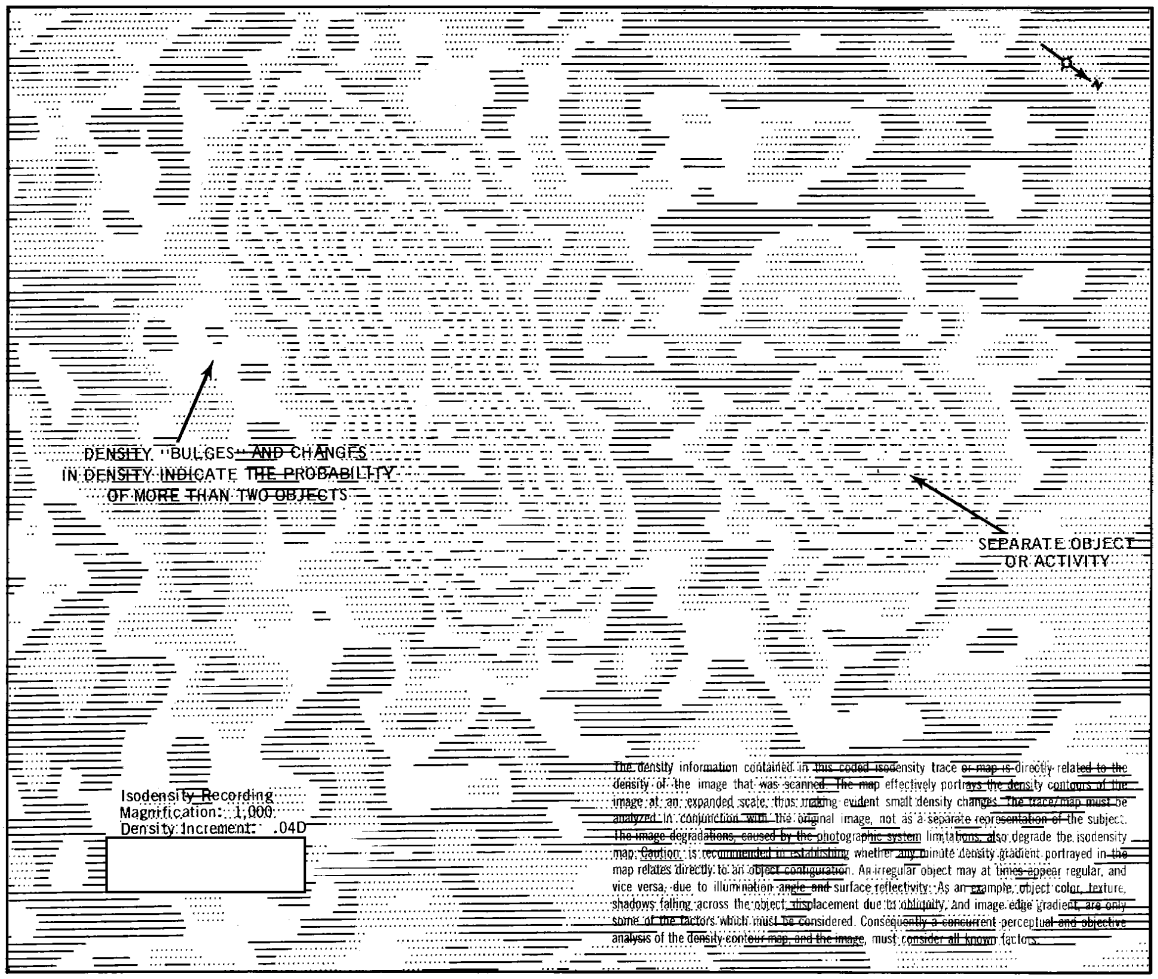

FIGURE 19. OBJECT NO 4, LAUNCH COMPLEX A, SSATC, USSR.

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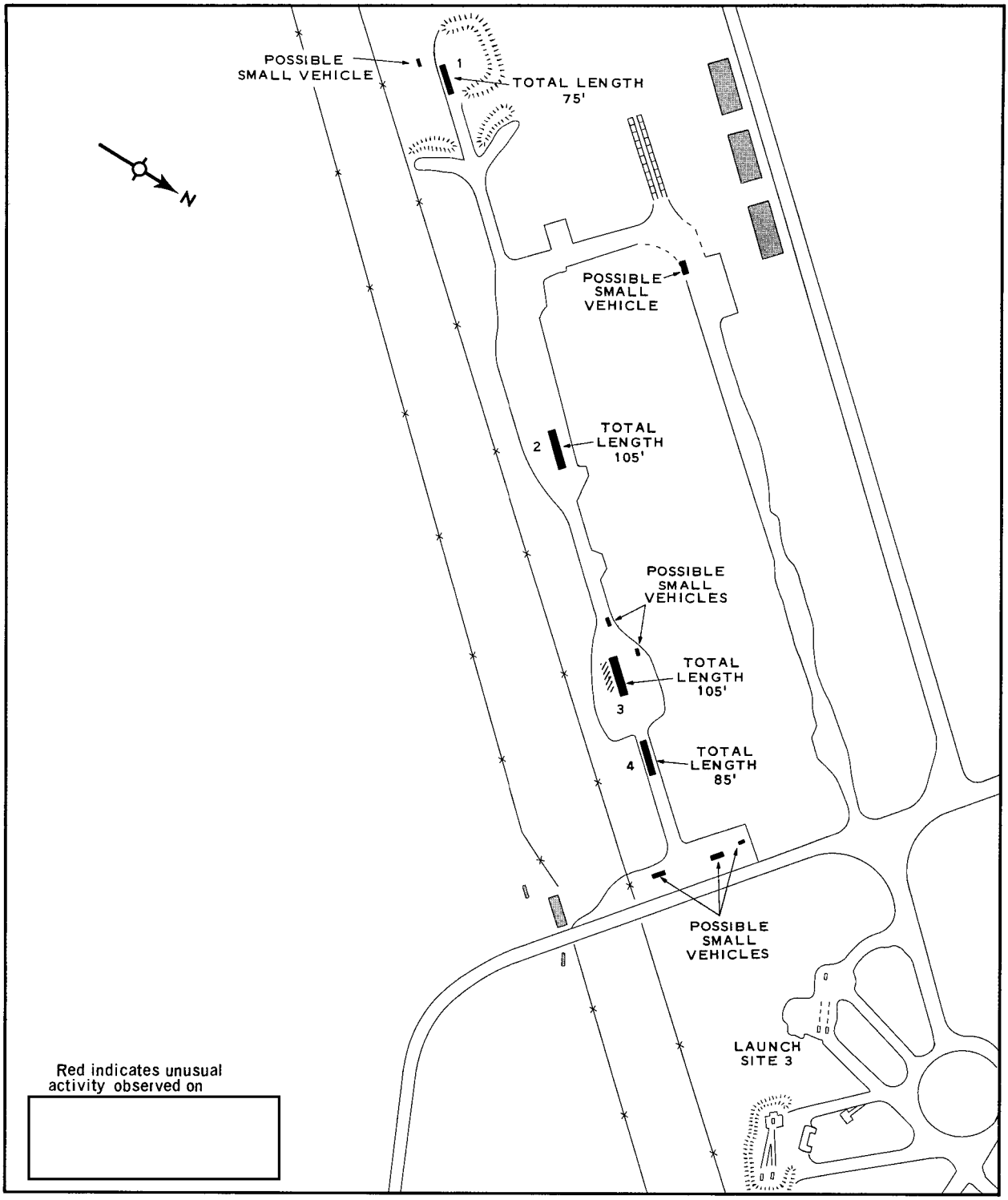

FIGURE 20. UNUSUAL ACTIVITY AT LAUNCH COMPLEX A, SSATC, USSR.